

Gas Turbine Engine Cooling System and Method

Abstract

Fuel supplied to a rotary fluid trap is centrifugally accelerated within a first cavity adjacent a first side of a rotor, and is then directed through a plurality of first passages extending through the rotor between and proximate to the blades, and shaped so as to at least partially conform to the shape of the blades. Second passages extend within the blades from the first passages and terminate within associated cavities proximate to the tips of the blades. Relatively cooler fuel in the first passages is thermosiphon exchanged for relatively hotter fuel in the second passages so as to cool the blades. The heated fuel flows into a second cavity adjacent to a second side of the rotor and is discharged from the rotating frame of reference directly into the combustion chamber through a second rotary fluid trap. A separate fuel distribution circuit is used for starting and warm-up.